

A NEW SPECIES OF *ACROPERLA* (PLECOPTERA: GRIPOPTERYGIDAE) FROM NEW ZEALAND

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ABSTRACT

Harding, J.S. & Chadderton, W.L. (1995). A new species of *Acroperla* (Plecoptera: Gripopterygidae) from New Zealand. *New Zealand Natural Sciences* 22: 11-17.

Acroperla ancilis, a new species of Gripopterygidae collected from streams on Stewart Island, and from streams near Lindis Pass and the Upper Taieri River system, Central Otago is described. Adults can be distinguished from other species of *Acroperla* on the basis of male genitalia, pronotum shape, and the length of the final maxillary palp segments. The larvae have prominent and highly distinctive flanges on the pronotum.

KEYWORDS: Plecoptera - Gripopterygidae - *Acroperla ancilis* - new species - New Zealand.

INTRODUCTION

The stonefly genus *Acroperla* McLellan is endemic to New Zealand and contains three recognized species (McLellan 1977). *A. spiniger* (Tillyard) the type species, and *A. trivacuata* (Tillyard) were originally placed in the genus *Nesoperla* Tillyard, but *Nesoperla* was subsumed in *Aucklandobius* Enderlein by Illies (1963). McLellan (1977) subsequently erected *Acroperla* to contain *spiniger*, *trivacuata* and a new species *samuelyi* McLellan, reserving *Aucklandobius* for four species from the subantarctic, Auckland Islands. He also re-established *Nesoperla* as a valid genus and included in it *N. fulvescens* (Hare) and a new species *N. johnsi* McLellan from the Snares Islands. The larvae of *A. spiniger* and *A. trivacuata* were both described by Winterbourn (1965) and McLellan (1966), but the larva of *A. samuelyi* is unknown. In this paper we describe a new species of *Acroperla* and provide notes on its ecology and distribution. Area codes referred to in the text are those of Crosby *et al.* 1976.

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DESCRIPTION

ADULT

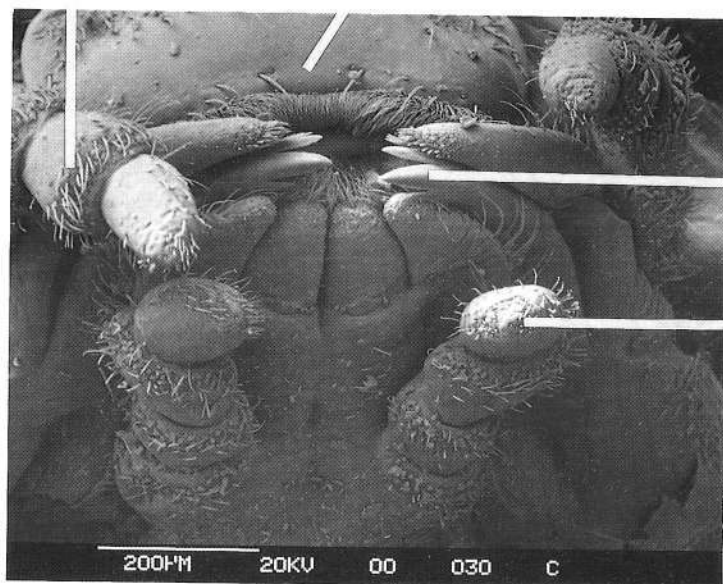
General colour golden brown, body length up to 10.8 mm.

Head: Antennae filiform with 40-50 segments, the first stout and quadrate; the second smaller, hour-glass shaped, the remainder light brown, quadrate with fine hairs. Head broader than long, light brown with small dark spots posteriorly; eyes black-brown, ocelli in darkened region, maxillary palps long with distal and 4th segments of roughly similar length; mandibles heavily chitinated with two rows of strongly developed teeth (Fig. 1.).

Thorax: Pronotum brown with pale kidney-shaped markings on either side of the dorsal midline. Pronotum broader than long (width: length ratio, 1:0.6), widest posteriorly, anterior angles slightly rounded, posterior lateral margins with acute angles or produced to form short spines (Fig. 2); mesonotum and metanotum a uniform brown colour; approximately the same width as the head. Legs narrow and covered in short fine hairs; femora round in cross-section with a light band on the proximal third, tibiae and tarsi light brown, covered in short hairs, the third tarsal segment longest. Wings light

Last 2 segments of Maxillary palp

Labrum



Mandibles

Labial palp

Figure 1. Scanning electron micrograph of mouthparts of *Acroperla ancilis* showing labrum, maxillary palps, mandibles and labial palps. The large maxillary palps with the final two segments of approximately equal length are clearly seen.

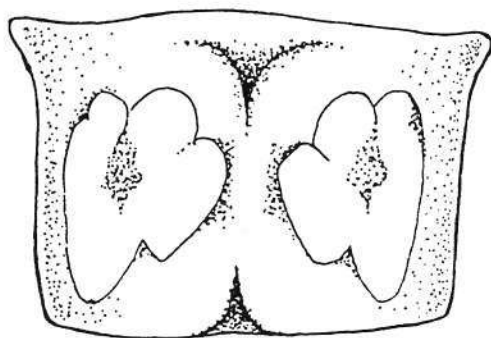


Figure 2. Pronotum of Adult.

brown without markings (Fig. 3).

Forewing: 9.5 mm

Hindwing: 9.0 mm

Abdomen: Brown with a pale band along the dorsal midline; cerci short with about 20 segments covered in short hairs.

Male genitalia: Posterior margin of the tenth tergite produced, appearing as a blunt triangle from the side and terminating as a small blunt dark concave projection (Fig. 4); epiproct projecting beyond the tip of the abdomen and curving upward to the level of this projection; paraprocts pale, curving inward and upward on either side and extending above the epiproct (Fig. 5); subgenital plate longer than broad, rounded posteriorly, covered in fine hairs.

Female genitalia: Sternite 8 posteriorly concave, with genital opening exposed. Paraprocts roughly triangular (Fig. 6).

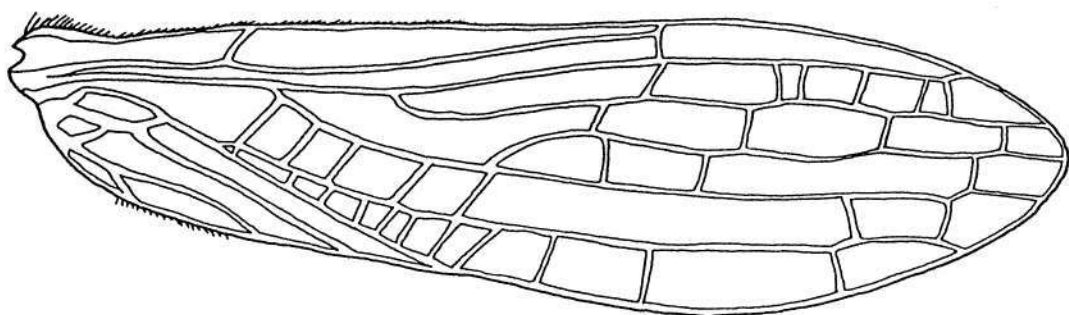


Figure 3. Forewing venation

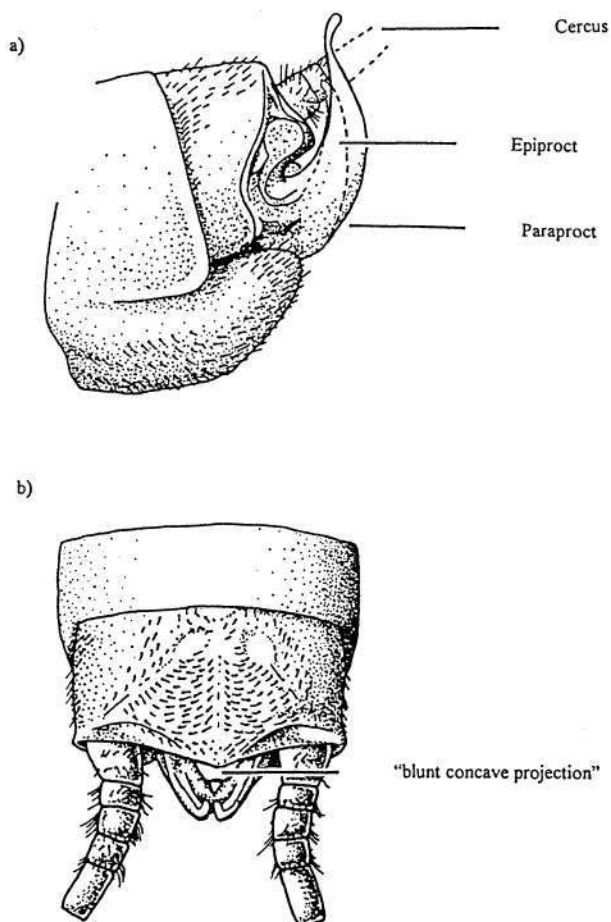


Figure 4. a) Lateral view of male genitalia, paraprocts are visible extending upward and encasing the epiproct, b) dorsal view of male genitalia.

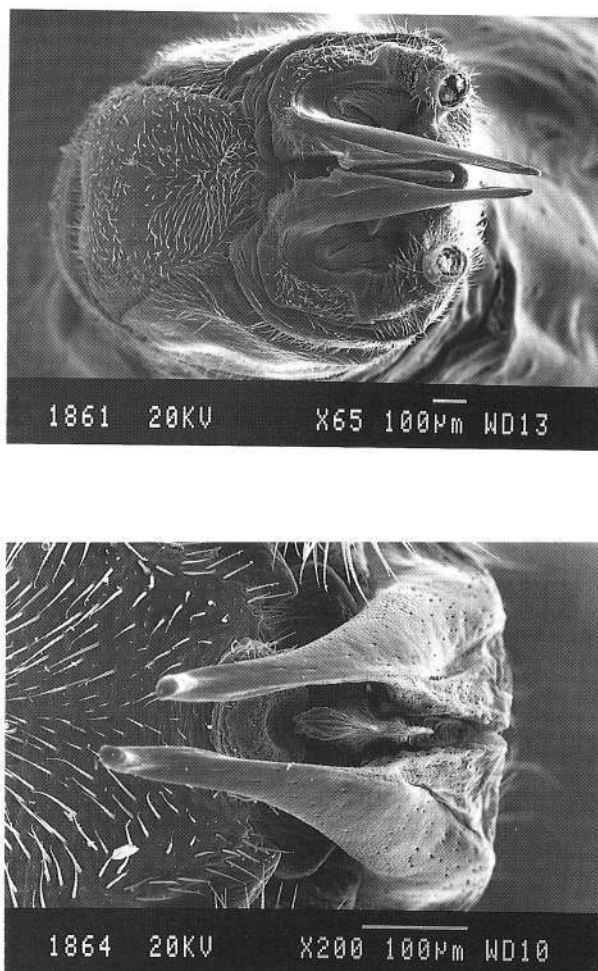


Figure 5. a) Scanning electron micrograph of the male genitalia from posterior view showing paraprocts surrounding the epiproct and extending above the line of the dorsal abdomen. The tip of the epiproct is in line with the concave projection, b) dorsal view, close up of the epiproct and concave protrusion.

LARVA

General colour dark brown, with pale patches on head, legs and dorsal segments. Epicranium dark brown with mottled pattern. Antennae filiform, tapering from a wide base to a relatively fine tip. Antennae about one third to half the length of the body (Table 1). Three ocelli present. Pronotum rectangular (width:length ratio 1.66:1) with strong, rounded flanges antero-laterally, the flanges protruding away from the body postero-laterally. The pronotum is covered in mottled markings, which are kidney-shaped centrally. Mesonotum and metanotum

with prominent markings either side of the midline. Legs dark brown with pale patches proximally and distally on each segment giving them a striped effect. Abdominal tergites with an inverted pale triangle in the midline; tergites 1-9 with oblique, pale bars that are, laterally concave on each side of the pale triangle, and each tergite with a row of four dark spots. The 10th tergite with a small pale patch anteriorly (Fig. 7). Anal gill rosette present. The dimensions of larvae in three size classes are shown in Table 1.

Table 1. Dimensions of larvae (mm)

	Body length	Antennae	Cerci	Pronotum	Head width
Late instar (n = 16)					
Range	7.5-10.8	2.2-4.9	1.5-2.0	2.2-2.5	1.4-1.8
Mean	9.3	3.7	1.9	2.3	1.6
Mid instar (n = 17)					
Range	5.5-7.0	2.1-2.7	1.1-1.3	1.8-2.0	1.2-1.4
Mean	6.1	2.3	1.2	1.9	1.2
Early instar (n = 10)					
Range	3.6-5.1	1.0-2.2	0.5-1.0	1.5-1.6	0.8-1.1
Mean	4.4	1.8	0.7	1.5	1.0

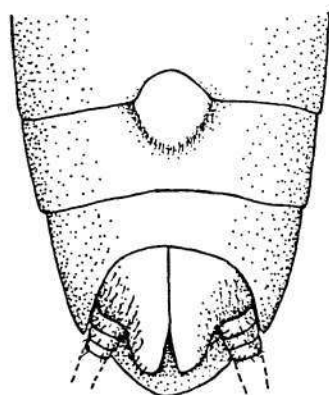


Figure 6. Ventral view of female genitalia.

DIFFERENTIAL DIAGNOSIS

Adults are generally similar to others in the genus, however the distal segment of the maxillary palp is not longer than the 4th segment. This condition necessitates a minor amendment to the generic diagnosis (McLellan 1977). The 'spiny' posterior angles on the pronotum differ from the condition found in all other described species. The forewing is uniformly brown whereas in *A. trivacuata* and *A. spiniger* pale patches are usually present, and unlike

other members of the genus the male paraprocts are long and hooked shaped and extend above the level of the abdomen. Larvae are clearly distinguished from others in the genus by the anteriorly and posteriorly flanged pronotum, with kidney-shaped patterning. The breadth and shape of the lateral pale concave bars on the abdominal segments distinguish it from *A. trivacuata*, and *A. spiniger*.

MATERIAL EXAMINED

Type material: Holotype male: New Zealand, MK, Long Slip Creek, December 1994, J.S. Harding, Canterbury Museum. Paratypes: 2 early instar larvae, SI, Rakeahua River, 12 March 1989, W.L. Chadderton; 8 late instar SI, Rakeahua River, 11 November 1989, W.L. Chadderton; 9 early instar, MK, Long Slip Creek, 16 February 1993, J.S. Harding; 14 mid/late instar, MK, Long Slip Creek, 19 September 1993, J.S. Harding; 4 mid instar, SI, Maori River, December 1993, N. Deans, R. Allibone & J.S. Harding. 26 larvae, MK, Long Slip Creek, 12 April 1994, J.S. Harding. 4 Adult males, raised from larvae in the laboratory, December 1994; 1 Adult female, raised from larva in the laboratory, December 1994.

Type specimens are lodged in the Entomology Collection, Canterbury Museum, Christchurch.

ETYMOLOGY

The specific name *ancilis*, (Latin for a mythical shield) refers to the distinctive flanged pronotum.

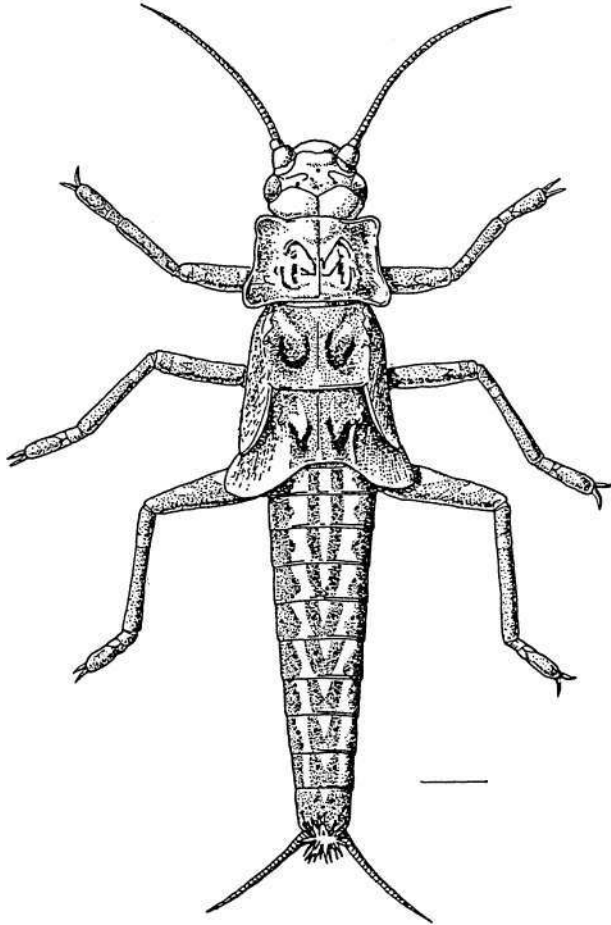


Figure 7. Dorsal view of late instar larva (scale bar = 1 mm).

NOTES ON BIOLOGY

Larvae were collected from 23 small to medium sized rivers in podocarp forested catchments on Stewart Island (Chadderton 1990), and an open tussock grassland stream, Long Slip Creek in the Lindis Pass, Central Otago. Larvae have also been collected from tussock catchment streams in the Taeri River - Linn Burn, Totara Creek, and Deighton Creek (R. Allibone & M. Scarsbrook pers comm). Early instars may be primarily aquatic and were collected from a range of substrate including ; wood,

leaf packs and cobbles. Late instars were abundant amongst mosses and on vegetation in the splash zone along stream banks. Early/mid instars were collected during February/March from Long Slip Creek and on Stewart Island and late instars were found in September/November. No adults were found in the field despite intensive searching, however, larvae moulted into adults in the laboratory in December/January. Gut analysis of late instar larvae from Long Slip Creek contained mainly fine particulate organic matter, including small fragments of wood.

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